

White Paper on "Carbon Dioxide"

General comment:

I have checked the more recent literature (1989 to 1992) in our on-line databases and added new information below.

Specific comments:

- 1> Would inert be the more common technical term instead of inactive ?
- 2> Add °C.

2a> Update on US regulatory status:

EPA has confirmed its previous regulatory conclusion in a Reregistration Eligibility Document and stated that products containing carbon dioxide do not pose unreasonable risks when used as directed by Agency-approved labeling and are eligible to reregistration (GRA&I, 13, 1992).

Ref.:

Govt Reports Announcements & Index (GRA&I), Issue 13, 1992

- 2b> The RTECS database cites an OSHA PEL 8-h TWA of 5,000 ppm (Federal Register 54, 2923, 89), but HAZARDLINE (last update 12/92) quotes a 10,000 ppm OSHA TWA and a 30,000 ppm OSHA short-term exposure limit. I believe that the HAZARDLINE TWA is incorrect and the figure 5,000 in the White Paper is correct. To my knowledge the OSHA TWA has not been raised since 1981.
- 3> ACGIH also stated a short term exposure limit (STEL) (usually for 15 min) of 30,000 ppm, which could be added here.
- 4> As stated in the RTECS and HAZARDLINE databases (Nov.92) NIOSH has reduced the TWA (10 h average) to 5,000.
- 5> A NIOSH RCL was not found in the retrieved databases. Instead a STEL (usually for 15 min) of 30,000 ppm is cited (RTECS, Nov.92).
- 5a> The threshold limits (LCLO) presently stated by HAZARDLINE (Jan.93) are:

Inhalation - Human	9 pph/5 min
- mammal	90,000 ppm/5 min

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Because of the differences to the figures in the White Paper, the uncertainty in the cited units of measure, the lack of information of the effect for which the figures are given, and the lack of a reference for them, I recommend to omit these limits altogether.

6> Extend to ... 8 to 10 hour average ..., because OSHA TWAs are based on 8 h working shifts.

6a> A respiratory rate of 20/min and a respiratory volume of 1 l represent relatively high figures. With a minute volume of 7 l/min (see White Paper page 12) and 8 h continuous exposure, 16,800 ml CO₂/day would be calculated; then the CO₂ delivered with 30 cigarettes/day would represent 8 % of the permissible exposure of workers under TWA conditions.

7> What is the basis of the comparison: Equal condensate dry weight, per cigarette, per g tobacco burned ... ?

8> lower elevations could be replaced by small elevations of the ambient CO₂ concentration

9> the offspring of, since malformations can only be initiated in the subsequent generation of the exposed animals

10> and the offspring of mice exposed to 10, 15, or 20 % CO₂ for 4 to 16 hours (Weaver and Scott, 1984)." (see 13>)

11> The basis for the statement that CO₂ at concentrations of 0.48 % for 10 min/day for 20 days and 0.42 % for 1 h/day for a month would not be well tolerated by humans is not clear.

12> In APPENDIX 3 a study of Levin et al. cited in the Govt Reports Announcements & Index (GRA&I), Issue 20, 1983, on synergistic effects of CO₂ and NO₂ following acute inhalation in rats could be added.

13> A more recent publication representing the first report of fetal limb malformations associated with maternal hypercapnia in mice (Weaver and Scott, 1984) could be added to APPENDIX 3.

Ref.:

Weaver, T.E., Scott, Jr., W.J., Acetazolamide teratogenesis: Association of maternal respiratory acidosis and ectrodactyly in C57BL/6J mice, Teratology 30: 187-193 (1984)

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